Ferdinand Bonn: A Canadian Remote Sensing Pioneer and 'Friend' of Viet Nam

1998-01-02

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[Photo: Presentation of Friendship Medal at IDRC: IDRC President Maureen O'Neill (left), Vietnamese Ambassador E. Dinh Thi Minh Huyen, the Hon. Diane Marleau, Ferdinand Bonn.]

A Canadian professor at the forefront of remote sensing has received a Friendship Medal from the Government of Viet Nam. Last summer Ferdinand Bonn, who teaches at the Université de Sherbrooke in Quebec, was recognized for his role in the development of information systems to monitor Viet Nam's flood-prone Red River Delta. Dr Bonn is only the second Canadian to receive the medal, which is the country's highest honour given to foreigners.

Dr Bonn's work in Viet Nam was partially funded by the International Development Research Centre (IDRC). The Centre marked his award with a special presentation in September 1997, during which the Hon. Diane Marleau, Canada's Minister for International Cooperation, called him a "father"of remote sensing in Canada.

Parallel paths

More modestly, Dr Bonn says the development of remote sensing has run parallel to his own career. A physical geographer by training, he came to Canada from France on an exchange program in 1969. While studying and teaching at Sherbrooke, he met a scientist from the US National Aeronautics and Space Administration (NASA) who was using a radiometer to analyse electro-magnetic radiation reflected from the earth. The university purchased a radiometer, which Dr Bonn used for his doctoral research on the effects of vegetation on soil temperatures and heat flux. Other remote sensing projects followed, including studies on the loss of heat from buildings and residences, and on crop areas prone to early frost.

A pioneer in remote sensing, Dr Bonn founded the Centre d'applications et de recherches en télédétection (CARTEL) at the university in 1985. Today it is the biggest facility of its kind in Canada. CARTEL attracts funding from both the private and public sectors and it has conducted projects in more than 20 countries.

Dr Bonn's association with IDRC began in 1986 with a project in the Dominican Republic, followed by others in Côte d'Ivoire, Morocco, and Viet Nam. The Viet Nam work began in a restaurant in Niger, where he met with Phan Van Cu, deputy director of the Institute of Geological Sciences of Viet Nam's National Centre of Natural Sciences and Technology. Over a meal, Phan Van Cu spelled out some of the problems facing the Red River Delta and convinced Dr Bonn of the need to develop an environmental monitoring system for the area.

Intense industrialization

The delta, which surrounds Hanoi, is undergoing intense industrialization and urbanization. It is the most heavily populated region in northern Viet Nam — with a population density of 700-800 per square kilometre — and accounts for half of the national rice production. Over the last two decades, natural catastrophes in the area have increased. The combination of chronic floods and deforestation has caused acute soil loss.

In 1993, with funding from IDRC, teams from CARTEL and Viet Nam's Institute of Geological Sciences began using use remote sensing to study environmental changes in the delta. The researchers focused on three problems: soil erosion on the surrounding hillsides; floods in the centre of the delta; and coastline evolution. When the project first began, radar images were gathered by airplane. But with the launch in 1995 of Radarsat, an earth observation satellite, more detailed satellite images became available.

Flood risk maps

Using geographic information systems, the team combined radar images with ground data to develop a series of flood risk maps for Nam Thanh district to help predict flooding and plan measures to reduce damage. These maps also serve as a land use planning tool for local agriculture. In Vinh Phu district, the project used information from remote sensing and digital topographic models to estimate the rate of soil erosion on denuded hills.

In addition to developing environmental monitoring systems, the project has strengthened the remote sensing capacity of Vietnamese researchers and institutions, through the provision of equipment and the creation of a library at the Institute. Several Vietnamese also visited CARTEL for research and training on specific software. The project paired Canadian and Vietnamese students to work on research problems.

Nice surprise

Dr Bonn is proud of the project's evolution from "a classic North-South project" to "a scientific partnership and exchange." The Institute recognized his role in fostering this collaboration by nominating him for the Friendship Medal, which was presented in August in Hanoi. He says the medal was a nice surprise but insists that much credit must go to his Vietnamese colleagues. Dr Bonn tells how Canadian researchers were preparing to install some image processing software at the Institute. But the Vietnamese said, "It's Friday — why don't you head to the seashore and we will work again after the weekend." The Canadians returned on Monday to find the software already installed and running smoothly.

Dr Bonn hopes to build on the project's achievements in a second phase, which is currently under discussion with IDRC. Phase two would focus on the effects of deforestation, soil loss, and new human settlements in the area upstream from Hanoi. As for his personal goals, he would like to spend more time popularizing science — he has already written the first French textbook on

remote sensing — and studying land degradation. Dr Bonn is particularly concerned about soil loss. "You can replant forests but it takes 500 years to regenerate soil," he explains.

Jennifer Pepall is an Ottawa-based writer and editor.

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